

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A detection system ~~including comprising:~~
  - (a) a detection cell having an entry gate; ~~the system including and~~
  - (b) a drive ~~means-unit~~ for controlling switching of ~~the said~~ gate,wherein ~~the said~~ drive ~~means-unit~~ is arranged to control switching of ~~the gate in a pseudorandom binary sequence- said gate in both a pseudo-random binary sequence and in a bit-flipped pseudo-random binary sequence,~~  
wherein the system is arranged to produce analyzing matrices corresponding to said pseudo-random binary sequence and to said bit-flipped sequence, and data sets corresponding to outputs obtained from the system for said pseudo-random binary sequence and for said bit-flipped pseudo-random binary sequence, and  
wherein said matrices and data sets are combined by matrix algebra to produce a system output with reduced noise.
- 2.-4. (Cancelled).
5. (Currently Amended) An IMS ~~IMS~~ detection system according to claim 1, wherein the cell has a drift region, and wherein ~~that~~ the gate is arranged to control entry to the drift region.
6. (Currently Amended) A method of controlling switching of an admittance gate in a detection system comprising, wherein the
  - (a) switching said gate is switched in both in a pseudo-random binary sequence and in a bit-flipped pseudo-random binary sequence;
  - (b) producing analyzing matrices corresponding to said pseudo-random binary sequence and to said bit-flipped sequence;
  - (c) producing data sets corresponding to outputs obtained from said system for said pseudo-random binary sequence and for said bit-flipped pseudo-random binary sequence;  
and

(d) using matrix algebra to combine said matrices and data sets to produce a system output with reduced noise.

7.-9. (Cancelled).